

REMARKS/ARGUMENTS

In response to the Office Action mailed July 17, 2007, Applicants amend their application and request reconsideration. In this Amendment claims 4-6, 9, 10, 13, and 14 are cancelled, and claims 15-17 are added so that claims 1-3, 7, 8, 11, 12, and 15-17 are now pending.

In this Amendment all remaining examined claims are amended for clarity. In addition, description has been added to, the two examined independent claims, claims 1 and 11, describing the voltage regulating circuit in more detail. In the described embodiments of the patent application, the voltage regulating circuit corresponds to element 150 and includes a plurality of elements shown within a box defined by broken lines in Figure 3. That figure and the voltage regulating circuit are described in detail from page 9, line 14, through page 11, line 21, and elsewhere within the patent application. While the invention as described by the claims is not limited by the embodiments described in the patent application, the voltage regulating circuit 150, sometimes described as a precharge regulating circuit, is distinctive in structure and function from the precharge switch 140.

The newly added claims 15-17 are clearly supported by the patent application as filed. The operation of the current supply circuit according to claim 15 is supported by the description pertaining to Figure 5 at pages 12 and 13 of the patent application. Claim 16 is supported by the same disclosure supporting the description added to claim 1. Original claim 5 also supplies much of the language of new claim 16. Claim 17 is derived from former claim 6 and therefore is supported by the application as filed.

As clearly described in the patent application, the precharge switch 140 and the switches 160-165 of the voltage regulating circuit all conduct at the same time, i.e., before the supply of the current or display current. In that precharging period, the data

line or node 11 is charged to the voltage V_{bf} because of the conductivity of the switch 140. At the same time, respective capacitors C0-C5 are charged to respective voltages V0-V5 through the respective switches 160-165. Thereafter, when the current or the display current is being supplied, respective switches 170-175 are turned on, depending upon the state of the digital data or image data that is simultaneously supplied to the switches 130-135 and 170-175. Thus, the corresponding capacitors, of the capacitors C0-C5, exchange electrical charge, i.e., supply or extract electrical charge from the current output node or current data line so that a steady state voltage on that output node or current line is reached. That steady voltage is reached much more quickly in the invention than in the absence of the voltage regulating circuit 150. The difference in the speed of reaching the steady state is illustrated in Figure 6 of the patent application and described with respect to that figure. By the time the display data or image data are activated, the switch 140 and the switches 160-165 have been turned off because the precharging of the current output node or data line and of the capacitors C0-C5 has been completed.

The structure and function of the invention as disclosed and claimed in the present patent application has just been described with respect to embodiments encompassed by the claims under examination. All of those examined claims, with the exception of claim 8, were rejected as unpatentable over Kasai (Published U.S. Patent Application 2003/0030602) in view of Fruehauf (Published U.S. Patent Application 2004/0100430). This rejection is respectfully traversed.

In making the rejection, the Examiner readily acknowledged that Kasai does not describe any circuits that might correspond to the voltage regulating circuit, particularly as described in examined claims 4 and 13. Accordingly, the more specifically described voltage regulating circuit of amended claims 1 and 11 is acknowledged to be absent from Kasai, although Kasai describes precharging with respect to element 430 of Figure 6 of that publication. Therefore, Fruehauf was relied upon, without much explanation, as describing "a voltage regulating circuit for an

active matrix driving circuit". Further, it was asserted that it would have been obvious to incorporate that voltage regulator of Fruehauf into the Kasai display device with the result that the invention would have been produced. Applicant disagrees, most fundamentally, because Freuhauf fails to describe a voltage regulating circuit having any similarity in structure or function to the voltage regulating circuit described and claimed in amended claims 1 and 11.

The brief disclosure of Freuhauf is directed to making more uniform light emission of light-emitting devices that would otherwise vary because of manufacturing fluctuations in the production of thin film transistors that are employed to drive the light-emitting devices. In the single figure of Freuhauf, a schematic circuit diagram, it is apparent that the transistor T3 senses the voltage at the anode at the light-emitting diode. The sensed voltage is supplied to a mysterious voltage shifter and, after shifting, then to a comparator 12 where the value is compared to a reference value. Based upon the reference value comparison, an adjustment may be made through transistors T2 and T1 to the current flowing through the light-emitting diode, as indicated by the anode voltage of that diode.

The Freuhauf circuit is entirely unlike the voltage regulating circuit of the pending claims. In those voltage regulating circuits, an exchange of electrical charge, which might be compared to the change in the current flowing through the light emitting diode in Freuhauf, corresponds to digital data or digital image data of n bits where n must be at least 2. By contrast, in Freuhauf, there is no digital sensing. The analog sensing and regulation does not respond to any digital signal of any number of bits. Moreover, Freuhauf makes no provision for dealing with a multiple-bit signal. Further, the output of any error signal and its magnitude from the comparator has no relationship to any digital signal or image signal that is digital and that includes at least two bits. Thus, important elements of the voltage regulating circuits as described in the examined claims and amended claims 1 and 11 are missing not only from Kasai but also from Freuhauf. Therefore, *prima facie* obviousness of the claims now


pending cannot be established based upon any hypothetical modification of Kasai with Freuhauf.

The dependent claims that were rejected on the same basis as the examined independent claims are patentable because of their dependency.

Claim 8 was rejected as obvious over Kasai, in view of Freuhauf and further in view of Koyama et al. (Published U.S. Patent Application 2002/0024054, hereinafter Koyama). This rejection is likewise respectfully traversed because, even if Koyama should supply the limitation of claim 8, for the reasons already presented Kasai and Freuhauf fail to disclose the limitations of amended claims 1 and 7, from which claim 8 depends. Thus, *prima facie* obviousness has not been established with respect to that claim 8 and further discussion of that rejection is not necessary.

Reconsideration and allowance of claims 1-3, 7, 8, 11, 12, and 15-17 are earnestly solicited.

Respectfully submitted,


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Date: November 12, 2007
JAW:ves

Amendment or ROA - Regular (Revised 2007 02 08)